

### **REMARKS**

The Office Action of January 28, 2010, has been carefully studied. Claims 1-3 currently appear in this application. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicant respectfully requests favorable reconsideration and formal allowance of the claims.

Claims 1 to 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohsaka et al., US 2001/0044074 and Namba et al., US 6071572 in view of Sun et al., *The Imaging Science Journal* **(7)2:1113-1117**, 1000.

The Examiner alleges that one of ordinary skill in the art would have been motivated to make the herein claimed cyanine dyes of Formula 1 by substituting a monomethine cyanine dye as disclosed by Namba or by Sun for the trimethine cyanine dye of Hohsaka or by substituting the perchlorate or bisphenyldithiol metal complex anion disclosed by Sun and Namba with the azo metal complex anion of Hohsaka with the expectation that additional cyanine dyes useful for optical recording material could be obtained.

The Examiner further alleges that the residual dye rate (%) of the dye claimed herein would be an inherent property of the dyes obtained by combining the teachings of Hohsaka, Namba and Sun.

This rejection is respectfully traversed.

Hohsaka discloses trimethine cyanine dyes. There is nothing in Hohsaka that suggests the monomethine cyanine dyes claimed herein. No one

skilled in the art would have been motivated to substitute the Hohsaka trimethine cyanine dyes with a monomethine cyanine dye with a reasonable expectation of obtaining useful cyanine dyes, because Hohsaka is directed solely to trimethine cyanine dyes, and substituting the trimethine cyanine dyes by a monomethine cyanine dye would destroy the principal concept of Hohsaka's invention.

Namba, on the other hand, discloses monomethine cyanine dyes which require benzenedithiol metal complex anions represented by formula 1 at column 45 as a counter ion. Namba found that replacing a counter ion such as  $\text{ClO}_4^-$ ,  $\text{BF}_4^-$  or  $\text{I}^-$  (please see column 40, line 64 to column 41, line 5) in conventional cyanine dyes with a benzenedithiol metal complex anion was effective for overcoming the disadvantages of conventional cyanine dyes. That is, the benzenedithiol metal complex ion is indispensable to the monomethine dye of Namba. Because the benzenedithiol metal complex provides the advantages of the Namba dyes, one skilled in the art would not substitute another anion in these monomethine dyes. Substituting another anion, such as an azo metal complex anion, for the Namba benzenedithiol metal complex ion, would destroy the principal element of Namba's invention and contradict Namba's teachings. Therefore, it is respectfully submitted that no one would have been motivated to substitute another anion for the Namba benzenedithiol metal ion complex, with reasonable expectation of obtaining a useful cyanine dye.

Sun discloses monomethine dyes, such as the compound D-1, that have a perchlorate ion as the counter ion. There is nothing in Sun that teaches a monomethine cyanine dye that has an azo metal complex as a counter ion. Therefore, it is respectfully submitted that no one would have been motivated to substitute an azo metal complex anion by perchlorate ion with a reasonable expectation of obtaining a cyanine dye useful for optical recording media.

Contrary to this, as shown in Table 1 of the instant specification, the herein claimed monomethine cyanine dye that has an azo metal complex as the counter ion, such as the monomethine cyanine dyes represented by chemical formulae 1 and 9 shows **a residual dye rate about three times greater** than that of conventional cyanine dyes, such as those with a perchlorate counter ion, such as the monomethine cyanine dyes represented by chemical formulae 14 and 16. This shows quite unexpected results from using an azo metal complex as the counter ion.

Furthermore, as shown in Example 1 of the instant specification, the claimed monomethine cyanine dye that has an azo metal complex as the counter ion, such as the monomethine cyanine dye represented by chemical formula 1, has a decomposition point around 245°C, while a cyanine dye which has a perchlorate counter ion, such as the monomethine cyanine dye represented by chemical formula 14 has a decomposition point around 210°C. The decomposition point of the herein claimed cyanine dye is about 30°C higher than that of the conventional cyanine dye.

Similarly, as shown in Example 2 of the instant specification, the herein claimed monomethine cyanine dye having an azo metal complex as the counter ion, such as the monomethine cyanine dye represented by chemical formula 9, which has a decomposition point around 305°C, while a cyanine dye that has a perchlorate counter ion, such as the monomethine cyanine dye represented by chemical formula 16, has a decomposition point around 270°C. The decomposition point of the herein claimed monomethine cyanine dye is about 35°C higher than that of the conventional monomethine cyanine dye.

As described above, the different counter ions impart greatly different decomposition points to monomethine cyanine dyes. This is evidence of unexpected results. None of Hohsaka, Namba and Sun, taken alone or in combination, suggest that such differences in residual dye rate and decomposition point can be obtained with different counter ions.

With respect to unexpected results of the herein claimed invention, the Examiner states that "it is well known in the art that cyanine dye compounds comprising a cyanine cation with an azo metal complex anion have a higher decomposition point than some cyanine dyes composed of the same cyanine cation with a certain non-azo metal complex anion." The Examiner points out the comparison between the cyanine dye compound of chemical formulae 23 and 25 in Table 1 in column 2 of Kasada et al., US 6,525,181. The Examiner indicates that the cyanine dye with the metal complex of azo anion (chemical formula 25) had a decomposition point of 312.8°C as compared to the cyanine dye with the

perchlorate anion (chemical formula 23) that had a decomposition point of 308.0°C.

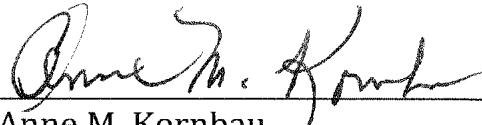
However, it should be noted that the cyanine dye compounds of chemical formulae 23 and 25 are both trimethine cyanine dyes, not monomethine cyanine dyes. Further, attention is directed to the comparison between the trimethine cyanine dye of chemical formula 4 and the trimethine cyanine dye of chemical formula 6, both shown in Table 1 of Kasada. The trimethine cyanine dye of chemical formula 4, in which the counter ion is  $\text{BF}_4^-$ , had a decomposition point of 324.3°C, while the trimethine cyanine dye having an azo metal complex anion, chemical formula 6, had a decomposition point of 313.0°C. Clearly, the trimethine cyanine dye having an azo metal complex anion had a decomposition point lower than that of the trimethine cyanine dye with the  $\text{BF}_4^-$  counter anion. Therefore, it is respectfully submitted that it is **not** known in the art that cyanine dye compounds comprising a cyanine cation with an azo metal complex anion have a higher composition point than some cyanine dyes composed of the same cyanine cation with a certain non-azo metal complex anion. It is therefore unexpected that a monomethine cyanine dye with an azo metal complex anion would have a decomposition point higher than a monomethine cyanine dye with a perchlorate anion. The advantageous properties of the monomethine cyanine dyes claimed herein are unexpected.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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